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Claims

What is claimed is:

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1. A method of capturing and processing information from a plurality of forms concurrently, said forms being randomly positioned on a moving conveyor belt, such that the form is visible to an imager, the method comprising the steps of:

capturing an image of said conveyor belt;

locating at least one of said plurality of forms in said captured image, said at least one form is comprised of a plurality of information data fields; and

decoding at least one of said plurality of information data fields.

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2. The method of claim 1 including the step of repeating the locating and decoding steps until every form in said captured image has been processed.

20

3. The method of claim 1 wherein said image is comprised of a plurality of non-singulated forms.

4. The method of claim 3 wherein said captured image is comprised of a plurality of unjustified forms.

25

5. The method of claim 1 wherein said locating step is further comprised of the steps of:

5

locating a predetermined pattern in said captured image;  
locating at least one fiduciary mark in said captured image, said at least one fiduciary  
mark does not exceed a predetermined distance from said predetermined pattern; and  
determining a region of interest, said region of interest circumscribes an area including  
said predetermined pattern and said at least one fiduciary mark.

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6. The method of claim 5, wherein said predetermined pattern is a machine  
readable code.

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7. The method of claim 5, wherein said predetermined pattern is numeric,  
alphanumeric, or alphabetic text.

20

8. The method of claim 5, wherein said predetermined pattern is a picture.  
9. The method of claim 5 wherein said step of locating a predetermined pattern is  
further comprised of the steps of:

determining that a portion of said predetermined pattern is missing from said captured  
image; and

combining said captured image with at least one prestored image to create a complete  
predetermined pattern.

25

5           10.    The method of claim 5 wherein said determining step is further comprised of  
the steps of:

          determining that a portion of the region of interest is missing from said captured  
image; and

          combining said captured image with at least one prestored image to create a complete  
10   region of interest.

          11.    The method of claim 1 wherein said decoding step is comprised of the steps of:  
          measuring a spatial relationship between at least one fiduciary mark and a  
predetermined pattern, said spatial relationship identifying a location and format of at least  
15   one of said plurality of information data fields located on said form; and  
          decoding at least one of said plurality of information data fields.

          12.    The method of claim 11 wherein the decoding step is comprised of the  
following steps:

20           identifying a originating source associated with said form;  
          extracting information from at least one of said information data fields;  
          decoding said extracted information using a recognition engine, wherein said  
recognition engine is determined by the location and format of said information data field;  
          comparing said decoded information with a database entry of package information  
25   associated with said originating source; and

5 replacing said decoded information with said package information, provided a predetermined criteria is met.

13. The system of claim 12 further comprising of the step of re-ordering said package information database, provided a predetermined criteria is met.

10

14. A computer system for capturing and processing information from a plurality of forms traveling on a conveyor belt, concurrently, comprising:

a memory having program instructions; and

15 a processor configured to use the program instructions to capture an image of said plurality of forms; to locate at least one of said plurality of forms in said captured image, wherein said at least one form is comprised of a plurality of information data fields; and to decode the information on said at least one of said plurality of forms.

20 15. The computer system according to claim 14, wherein the processor is further configured to repeat the locating and decoding instructions until every form in said captured image has been processed.

16. The computer system according to claim 14 wherein the locating instruction is further comprised of the following instructions:

25 locate a predetermined pattern in said captured image;

5           locate at least one fiduciary mark in said captured image, wherein said at least one  
fiduciary mark does not exceed a predetermined distance from said predetermined pattern; and  
determine a region of interest, wherein said region of interest circumscribes an area  
including said predetermined pattern and said at least one fiduciary mark.

10           17.   The computer system according to claim 14, wherein the locating a  
predetermined pattern instruction is further comprised of the following instructions:  
determine that a portion of said predetermined pattern is missing from said captured  
image; and  
combine the captured image with at least one prestored image to create a complete  
15   predetermined pattern.

18.   The computer system according to claim 16, wherein the determining  
instruction is further comprised of the following instructions:  
determine that a portion of the region of interest is missing from said captured image;  
20   and  
combine the captured image with at least one prestored image to create a complete  
region of interest.

19.   The computer system according to claim 14, wherein the decoding instruction  
25   is further comprised of the following instructions:

5           measure a spatial relationship between at least one fiduciary mark and a predetermined  
pattern, said spatial relationship identifying a location and format of at least one of said  
plurality of information data fields located on said form; and  
decode at least one of said plurality of information data fields.

10           20.    The computer system according to claim 19, wherein the decoding instruction  
is further comprised of the following instructions:

          identify a originating source associated with said form;  
          extract information from at least one of said information data fields;  
          decode said extracted information using a recognition engine, wherein said recognition  
15   engine is determined by the location and format of said information data field;  
          compare said decoded information with a database entry of package information  
associated with said originating source; and  
          replace said decoded information with said package information, provided a  
predetermined criteria is met.

20           21.    The system of claim 20 further comprising of the instruction to reorder said  
database entry of package information, provided a predetermined criteria is met.

          22.    A system for capturing and processing information from a plurality of forms  
25   concurrently, said forms being randomly positioned on a moving conveyor belt such that the  
form is visible, said system comprising:

5 means for capturing an image of said conveyor belt;  
means for locating at least one of said plurality of forms in said captured image,  
wherein said at least one form is comprised of a plurality of information data fields; and  
means for decoding the information on said at least one of said plurality of forms.

10 23. The system of claim 22 including means for executing the means for locating  
and the means for decoding until every form in said captured image has been processed.

24. The system of claim 22, wherein the means for locating is further comprised of:  
means for locating a predetermined pattern in said captured image;  
15 means for locating at least one fiduciary mark in said captured image, said at least one  
fiduciary mark does not exceed a predetermined distance from said predetermined pattern; and  
means for determining a region of interest, said region of interest circumscribes an area  
including said predetermined pattern and said at least one fiduciary mark.

20 25. The system of claim 24, wherein the means for locating is further comprised of:  
means for determining that a portion of said predetermined pattern is missing from  
said captured image; and  
means for combining said captured image with at least one prestored image to create a  
complete predetermined pattern.



5                   26.    The system of claim 24, wherein the means for determining is further  
comprised of:

                  means for determining that a portion of the region of interest is missing from said  
captured image; and

                  means for combining said captured image with at least one prestored image to create a  
10   complete region of interest.

                  27.    The system of claim 22 wherein the means for decoding is further comprised  
of:

                  means for measuring a spatial relationship between at least one fiduciary mark and a  
15   predetermined pattern, said spatial relationship identifying a location and format of at least  
one of said plurality of information data fields located on said form; and

                  means for decoding at least one of said plurality of information data fields.

                  28.    The system of claim 27 wherein the means for decoding is further comprised  
20   of:

                  means for identifying an originating source associated with said form;

                  means for extracting information from at least one of said information data fields;

                  means for decoding said extracted information using a recognition engine, wherein  
said recognition engine is determined by the location and format of said information data  
25   field;

5 means for comparing said decoded information with a database entry of package information associated with said originating source; and

means for replacing said decoded information with said package information, provided a predetermined criteria is met.

10 29. The system of claim 28 further comprising of means for re-ordering said package information database, provided a predetermined criteria is met.

15 30. A method of accessing package routing information on a computer network involving at least one user terminal and at least one alias server, said method comprising the steps of:

inputting information at a user terminal to retrieve package routing information, wherein said inputted information contains package identification required by said at least one alias server to retrieve said package routing information;

20 transmitting said inputted information from said user terminal to said alias server; and transferring package routing information from said alias server to said user terminal, provided said alias server locates a database record corresponding to said inputted information.

25 31. The method of claim 30, wherein said step of transferring package routing information further comprises the step of accessing a package information server by said alias server.

5                   32.    The method of claim 30, wherein said step of transferring package routing  
information further comprises the step of accessing a package tracking database by said alias  
server.

10                   33.    A computer system for accessing package routing information on a computer  
network involving at least one user terminal and at least one alias server, comprising:  
a memory having program instructions; and  
a processor configured to use the program instructions to access customer-inputted  
information for retrieving package routing information, wherein said inputted information  
contains package identification required by said at least one alias server to retrieve said  
15   package routing information; to transmit said inputted information from said user terminal to  
said alias server; and to transfer package routing information from said alias server to said user  
terminal, provided said alias server locates a database record corresponding to said inputted  
information.

20                   34.    The computer system according to claim 33, wherein the transferring  
instruction further comprises the instruction to access a package information server by said  
alias server.

25                   35.    The computer system according to claim 33, wherein the transferring  
instruction further comprises the instruction to access a package tracking database by said  
alias server.

5                   36.    A computer system for accessing package routing information on a computer network involving at least one user terminal and at least one alias server, said system comprising:

                  means for inputting information at a user terminal to retrieve package routing information, wherein said inputted information contains package identification required by  
10           said at least one alias server to retrieve said package routing information;

                  means for transmitting said inputted information from said user terminal to said alias server; and

                  means for transferring package routing information from said alias server to said user terminal, provided said alias server locates a database record corresponding to said inputted  
15           information.

                  37.    An imaging system for capturing a non-singulated image of a plurality of forms traveling on a moving conveyor belt, comprising:

                  a primary lens assembly for converging a beam of light emitted from a surface of a  
20           conveyor belt towards a secondary lens assembly;

                  a secondary lens assembly for converging said beam of light from said primary lens assembly towards an image detector;

                  a phase mask positioned between said secondary lens assembly and said image detector for altering said beam of light such that said imaging system is insensitive to small  
25           distances between objects positioned on said conveyor belt and said image detector;

5           a beamsplitter disposed between said phase mask and said image detector for splitting  
said beam of light to a plurality of image detectors;

          a first image detector for generating an output signal of a first portion of said conveyor  
belt; and

10           a second image detector for generating an output signal of a second portion of said  
conveyor belt, said second image detector disposed at a 90° angle from said first image  
detector.

38.     The imaging system of claim 37, wherein the phase mask is encoded with a  
separable point spread function.